ATTACHMENT A

DEP7007 Forms (AI, A, N and V)

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007AI

Administrative Information

___ Section AI.1: Source Information

___ Section AI.2: Applicant Information

___ Section AI.3: Owner Information

___ Section AI.4: Type of Application

___ Section AI.5: Other Required Information

___ Section AI.6: Signature Block

___ Section AI.7: Notes, Comments, and Explanations

Additional Documentation

___ Additional Documentation attached

Source Name: **Buffalo Trace Distillery, Inc.**

KY EIS (AFS) #: **21-073-00009**

Permit #: **V-12-056**

Agency Interest (AI) ID: **1373**

Date: **9/25/2019**

Section AI.1: Source Information

Physical Location Address:	**Street:**	113 Great Buffalo Trace				
	City:	Frankfort	**County:**	Franklin	**Zip Code:**	40601
Mailing Address:	**Street or P.O. Box:**	*Same as physical address*				
	City:		**State:**		**Zip Code:**	

Standard Coordinates for Source Physical Location

Longitude: -84.871° E (decimal degrees) **Latitude:** 38.216694° N (decimal degrees)

Primary (NAICS) Category: Distilleries **Primary NAICS #:** 312140

Classification (SIC) Category: Distilled and Blended Liquors **Primary SIC #:** 2085

Briefly discuss the type of business conducted at this site: The site produces distilled spirits. Grain is delivered, ground, and introduced to mash cookers. The mash is fed to fermenters and then to distillation columns and condensers. The resulting liquid is stored in tanks, transferred to barrels for aging, and/or sent to the bottling area for packaging. Barrels of bourbon are stored in rick houses for aging. The spent grain is sold as distiller's dried grain. Beverage ingredients are received in bulk for blending, and other distilled spirits are received by the facility in bulk and sent to the bottling area for packaging.

Description of Area Surrounding
☐ Rural Area ☐ Industrial Park ☐ Residential Area
☐ Urban Area ☐ Industrial Area ☑ Commercial Area

Is any part of the source located on federal land? ☐ Yes ☑ No

Number of Employees: 474

Approximate distance to nearest residence or commercial *Adjacent*

Property Area: 430 Acres

Is this source portable? ☐ Yes ☑ No

What other environmental permits or registrations does this source currently hold or need to obtain in Kentucky?

NPDES/KPDES:	☑ Currently Hold	☐ Need	☐ N/A
Solid Waste:	☐ Currently Hold	☐ Need	☑ N/A
RCRA:	☐ Currently Hold	☐ Need	☑ N/A
UST:	☐ Currently Hold	☐ Need	☑ N/A

Type of Regulated Waste Activity:
☐ Mixed Waste Generator ☑ Generator ☐ Recycler ☐ Other: _____
☐ U.S. Importer of Hazardous Waste ☐ Transporter ☐ Treatment/Storage/Disposal Facility ☐ N/A

Section AI.2: Applicant Information

Applicant Name: Buffalo Trace Distillery

Title: (if individual)

Mailing Address:
Street or P.O. Box: 113 Great Buffalo Trace
City: Frankfort **State:** KY **Zip Code:** 40601

Email: (if individual)

Phone: (502) 223-7641

Technical Contact

Name: Andrew Leet

Title: Environmental Engineer

Mailing Address:
Street or P.O. Box: 113 Great Buffalo Trace
City: Frankfort **State:** KY **Zip Code:** 40601

Email: aleet@buffalotrace.com

Phone: (859) 705-8187

Air Permit Contact for Source

Name: Andrew Leet

Title: Environmental Engineer

Mailing Address:
Street or P.O. Box: 113 Great Buffalo Trace
City: Frankfort **State:** KY **Zip Code:** 40601

Email: aleet@buffalotrace.com

Phone: (859) 705-8187

Section AI.3: Owner Information

☑ **Owner same as applicant**

Name:

Title:

Mailing Address: **Street or P.O. Box:**

City: **State:** **Zip Code:**

Email:

Phone:

List names of owners and officers of the company who have an interest in the company of 5% or more.

Name	Position
Wholly-owned subsidiary of the Sazerac Company; New Orleans, LA	

Section AI.4: Type of Application

Current Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ General Permit ☐ Registration ☐ None

Requested Action: *(check all that apply)*

☐ Name Change	☐ Initial Registration	☐ Significant Revision	☐ Administrative Permit Amendment
☑ Renewal Permit	☐ Revised Registration	☐ Minor Revision	☐ Initial Source-wide OperatingPermit
☐ 502(b)(10)Change	☐ Extension Request	☐ Addition of New Facility	☐ Portable Plant Relocation Notice
☐ Revision	☐ Off Permit Change	☐ Landfill Alternate Compliance Submitt	☐ Modification of Existing Facilities
☐ Ownership Change	☐ Closure		

Requested Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ PSD ☐ NSR ☐ Other: _____

Is the source requesting a limitation of potential emissions? ☐ Yes ☑ No

Pollutant:	Requested Limit:	Pollutant:	Requested Limit:
☐ Particulate Matter		☐ Single HAP	
☐ Volatile Organic Compounds (VOC)		☐ Combined HAPs	
☐ Carbon Monoxide		☐ Air Toxics (40 CFR 68, Subpart F)	
☐ Nitrogen Oxides		☐ Carbon Dioxide	
☐ Sulfur Dioxide		☐ Greenhouse Gases (GHG)	
☐ Lead		☐ Other	

For New Construction:

Proposed Start Date of Construction: *(MM/YYYY)* _____ **Proposed Operation Start-Up Date:** *(MM/YYYY)* _____

For Modifications:

Proposed Start Date of Modification: *(MM/YYYY)* _____ **Proposed Operation Start-Up Date:** *(MM/YYYY)* _____

Applicant is seeking coverage under a permit shield. ☐ **Yes** ☑ **No** **Identify any non-applicable requirements for which permit shield is sought on a separate attachment to the application.**

Section AI.5 Other Required Information

Indicate the documents attached as part of this application:

- [x] DEP7007A Indirect Heat Exchangers and Turbines
- [ ] DEP7007B Manufacturing or Processing Operations
- [ ] DEP7007C Incinerators and Waste Burners
- [ ] DEP7007F Episode Standby Plan
- [ ] DEP7007J Volatile Liquid Storage
- [ ] DEP7007K Surface Coating or Printing Operations
- [ ] DEP7007L Mineral Processes
- [ ] DEP7007M Metal Cleaning Degreasers
- [x] DEP7007N Source Emissions Profile
- [ ] DEP7007P Perchloroethylene Dry Cleaning Systems
- [ ] DEP7007R Emission Offset Credit
- [ ] DEP7007S Service Stations
- [ ] DEP7007T Metal Plating and Surface Treatment Operations
- [x] DEP7007V Applicable Requirements and Compliance Activities
- [ ] DEP7007Y Good Engineering Practice and Stack Height Determination
- [ ] DEP7007AA Compliance Schedule for Non-complying Emission Units
- [ ] DEP7007BB Certified Progress Report
- [ ] DEP7007CC Compliance Certification
- [ ] DEP7007DD Insignificant Activities
- [ ] DEP7007EE Internal Combustion Engines
- [ ] DEP7007FF Secondary Aluminum Processing
- [ ] DEP7007GG Control Equipment
- [ ] DEP7007HH Haul Roads
- [ ] Confidentiality Claim
- [ ] Ownership Change Form
- [ ] Secretary of State Certificate
- [ ] Flowcharts or diagrams depicting process
- [ ] Digital Line Graphs (DLG) files of buldings, roads, etc.
- [ ] Site Map
- [ ] Map or drawing depicting location of facility
- [ ] Safety Data Sheet (SDS)
- [ ] Emergency Response Plan
- [ ] Other: _____

Section AI.6: Signature Block

I, the undersigned, hereby certify under penalty of law, that I am a responsible official*, and that I have personally examined, and am familiar with, the information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the information is on knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or incomplete information, including the possibility of fine or imprisonment.

Harlen Wheatley
Authorized Signature

9/25/2019
Date

Harlen Wheatley
Type or Printed Name of Signatory

Master Distiller
Title of Signatory

*Responsible official as defined by 401 KAR 52:001.

Section AI.7: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007A

Indirect Heat Exchangers and Turbines

___ Section A.1: General Information
___ Section A.2: Operating and Fuel Information
___ Section A.3: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.
____ Manufacturer's specifications

Source Name: Buffalo Trace Distillery, Inc.
KY EIS (AFS) #: 21-073-00009
Permit #: V-12-056
Agency Interest (AI) ID: 1373
Date: 9/25/2019

Section A.1: General Information

Emission Unit #	Emission Unit Name	Process ID	Process Name	Identify General Type: Indirect Heat Exchanger, Gas Turbine, or Combustion Turbine	Indirect Heat Exchanger Configuration	Manufacturer	Model No./ Serial No.	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	SCC Code	SCC Units	Control Device ID	Stack ID
15	BOILER 11	01	NATURAL GAS COMBUSTION	INDIRECT HEAT EXCHANGER	Industrial Watertube Boiler	CLEAVER BROOKS BOILER/ LIMPSFIELD BURNER	Burner: LCNOAL175/ 00514	2002	10200602	MMscf	NA	S15
15	BOILER 11	02	GNS COMBUSTION	INDIRECT HEAT EXCHANGER	Industrial Watertube Boiler	CLEAVER BROOKS BOILER/ LIMPSFIELD BURNER	Burner: LCNOAL175/ 00514	2002	10200502	Mgal	NA	S15

Section A.2: Operating and Fuel Information

Emission Unit #	If multipurpose unit, identify the percentage of use by purpose				Rated Capacity Heat Input *(MMBTU/hr)*	Rated Capacity Power Output		Describe Operating Scenario (only if this unit will be used in different configurations)	Classify Fuel as Primary or Secondary	Identify Fuel Type: Coal, Natural Gas, Wood, Biomass, Landfill/Digester Gas, Fuel Oil # (specify 1-6), or Other	Heat Content (HHV)		Maximum Operating Hours	Ash Content *(%)*	Sulfur Content *(%)*
	Space Heat	Process Heat	Power	Emergency			*(Specify units: hp, MW, or lb steam/hr)*					*(Specify units: Btu/lb, Btu/gal, or Btu/scf)*			
15					60.5	Unk			Primary	Natural Gas	1,020	Btu/scf	8,760	N/A	N/A
15					60.5	Unk			Secondary	GNS	69,095	Btu/gal	8,760	N/A	N/A

Section A.3: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007N

Source Emissions Profile

__ Section N.1: Emission Summary
__ Section N.2: Stack Information
__ Section N.3: Fugitive Information
__ Section N.4: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI

Source Name: Buffalo Trace Distillery, Inc.
KY EIS (AFS) #: 21-073-00009
Permit #: V-12-056
Agency Interest (AI) ID: 1373
Date: 9/25/2019

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity (SCC Units/hour)	Pollutant	Uncontrolled Emission Factor (lb/SCC Units)	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency (%)	Control Efficiency (%)	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential (lb/hr)	Controlled Potential (lb/hr)	Uncontrolled Potential (tons/yr)	Controlled Potential (tons/yr)
15	BOILER 11	01	NATURAL GAS COMBUSTION	NA	NA	S15	0.059	PM	7.60	AP-42 Section 1.4 Table 1.4-2 (7/98)	100.00%	0.00%	0.451	0.451	1.97	1.97
								PM10	7.60	AP-42 Section 1.4 Table 1.4-2 (7/98)	100.00%	0.00%	0.451	0.451	1.97	1.97
								PM2.5	7.60	AP-42 Section 1.4 Table 1.4-2 (7/98)	100.00%	0.00%	0.451	0.451	1.97	1.97
								SO2	0.600	AP-42 Section 1.4 Table 1.4-2 (7/98)	100.00%	0.00%	0.036	0.036	0.156	0.156
								NOx	50.0	AP-42 Section 1.4 Table 1.4-1 (7/98)	100.00%	0.00%	2.97	2.97	13.0	13.0
								CO	84.0	AP-42 Section 1.4 Table 1.4-1 (7/98)	100.00%	0.00%	4.98	4.98	21.8	21.8
								VOC	5.50	AP-42 Section 1.4 Table 1.4-2 (7/98)	100.00%	0.00%	0.326	0.326	1.43	1.43
								CO2	119,317	EPA's GHG Reporting Rule (40 CFR 98), Table C-1	100.00%	0.00%	7,077	7,077	30,998	30,998
								CH4	2.25	EPA's GHG Reporting Rule (40 CFR 98), Table C-2	100.00%	0.00%	0.133	0.133	0.584	0.584
								N2O	0.225	EPA's GHG Reporting Rule (40 CFR 98), Table C-2	100.00%	0.00%	0.013	0.013	0.058	0.058
								CO2e	119,440	Scaled GHG by GWP	100.00%	0.00%	7,084	7,084	31,030	31,030
								Total HAPs	1.89	Sum of HAPs, AP-42 Section 1.4 Table 1.4-3 (7/98)	100.00%	0.00%	0.112	0.112	0.491	0.491

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity (SCC Units/hour)	Pollutant	Uncontrolled Emission Factor (lb/SCC Units)	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency (%)	Control Efficiency (%)	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential (lb/hr)	Controlled Potential (lb/hr)	Uncontrolled Potential (tons/yr)	Controlled Potential (tons/yr)
15	BOILER 11	02	GNS COMBUSTION	NA	NA	S15	0.088	PM	3.30	AP-42 Section 1.3 Table 1.3-1 & 2 (5/10)	100.00%	0.00%	0.289	0.289	1.27	1.27
								PM10	3.30	AP-42 Section 1.3 Table 1.3-1 & 2 (5/10)	100.00%	0.00%	0.289	0.289	1.27	1.27
								PM2.5	3.30	AP-42 Section 1.3 Table 1.3-1 & 2 (5/10)	100.00%	0.00%	0.289	0.289	1.27	1.27
								SO2	2.13	AP-42 Section 1.3 Table 1.3-1 (5/10)	100.00%	0.00%	0.187	0.187	0.817	0.817
								NOx	20.0	AP-42 Section 1.3 Table 1.3-1 (5/10)	100.00%	0.00%	1.75	1.75	7.67	7.67
								CO	5.00	AP-42 Section 1.3 Table 1.3-1 (5/10)	100.00%	0.00%	0.438	0.438	1.92	1.92
								VOC	0.200	AP-42 Section 1.3 Table 1.3-3 (5/10)	100.00%	0.00%	0.018	0.018	0.077	0.077
								CO2	10,425	EPA's GHG Reporting Rule (40 CFR 98), Table C-1	100.00%	0.00%	913	913	3,998	3,998
								CH4	0.168	EPA's GHG Reporting Rule (40 CFR 98), Table C-2	100.00%	0.00%	0.015	0.015	0.064	0.064
								N2O	0.017	EPA's GHG Reporting Rule (40 CFR 98), Table C-2	100.00%	0.00%	0.001	0.001	0.006	0.006
								CO2e	10,435	Scaled each pollutant by GWP	100.00%	0.00%	914	914	4,002	4,002
								Total HAPs	0.068	Sum of HAPs, AP-42 Section 1.4 Table 1.4-3 (7/98)	100.00%	0.00%	0.006	0.006	0.026	0.026

Section N.2: Stack Information

UTM Zone:

Stack ID	Identify all Emission Units (with Process ID) and Control Devices that Feed to Stack	Stack Physical Data			Stack UTM Coordinates		Stack Gas Stream Data		
		Equivalent Diameter *(ft)*	Height *(ft)*	Base Elevation *(ft)*	Northing *(m)*	Easting *(m)*	Flowrate *(acfm)*	Temperature *(°F)*	Exit Velocity *(ft/sec)*
S15	15	3.75	40	505	4,231,873	686,300	18,766	300	28.3

Section N.3: Fugitive Information

Zone:

Emission Unit #	Emission Unit Name	Process ID	Area Physical Data		Area UTM Coordinates		Area Release Data	
			Length of the X Side *(ft)*	Length of the Y Side *(ft)*	Northing *(m)*	Easting *(m)*	Release Temperature	Release Height *(ft)*

Section N.4: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007V

Applicable Requirements and Compliance Activities

___ Section V.1: Emission and Operating Limitation(s)
___ Section V.2: Monitoring Requirements
___ Section V.3: Recordkeeping Requirements
___ Section V.4: Reporting Requirements
___ Section V.5: Testing Requirements
___ Section V.6: Notes, Comments, and Explanations

Additional Documentation
___ Complete DEP7007AI

Source Name: Buffalo Trace Distillery, Inc.
KY EIS (AFS) #: 21-073-00009
Permit #: V-12-056
Agency Interest (AI) ID: 1373
Date: 9/25/2019

Section V.1: Emission and Operating Limitation(s)

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)

Section V.2: Monitoring Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
15	BOILER 11	N/A	40 CFR 63.11201(b); Table 2 of 40 CFR 63 Subpart JJJJJJ	Energy Efficiency	Conduct a one-time energy assessment in accordance with the requirements of Table 2 of 40 CFR 63 Subpart JJJJJJ.
15	BOILER 11	N/A	40 CFR 63.11223(b); Table 2 of 40 CFR 63 Subpart JJJJJJ	Tune-up	Conduct biennial tune-ups in accordance with the requirements of Table 2 of 40 CFR 63 Subpart JJJJJJ.

Section V.3: Recordkeeping Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
15	BOILER 11	N/A	40 CFR 63.11225(c)	General Recordkeeping	Maintain records of the one-time energy assessment, biennial tune-ups, notifications, and compliance reports as required under this section.
15	BOILER 11	N/A	40 CFR 63.11225(c)(2)(ii)	NHSM Criteria	Because GNS has been determined not to be solid waste pursuant to § 241.3(b)(1), keep a record documenting how the secondary material meets each of the legitimacy criteria under § 241.3(d)(1).

Section V.4: Reporting Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Reported	Description of Reporting
15	BOILER 11	N/A	40 CFR 63.11225(a)(2)	Initial Notification	File an initial notification within 120 days of becoming subject to the standard (BTD is interpreting the 120-day clock as starting on the date KDAQ provided feedback that Boiler 11 is subject to Boiler NESHAP requirements for oil subcategory boilers because of its GNS combustion).
15	BOILER 11	N/A	40 CFR 63.11225(a)(4)	NOCS	File a Notification of Compliance Status through CEDRI.
15	BOILER 11	N/A	40 CFR 63.11225(b)	Compliance Reports	File ongoing compliance reports biennially.

Section V.5: Testing Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing

Section V.6: Notes, Comments, and Explanations

ATTACHMENT B

Emission Calculations

B-1. Boiler 11 (EU ID 15) Operating Information

B-1.1 Boiler Duty and Fuel Consumption Data

Boiler Operating Information	Value	Units	Basis
Rated Heat Input Capacity	60.5	MMBtu/hr	Nameplate heat input rating
Maximum Fuel Usage - NG	0.059	MMscf/hr	= 60.5 MMBtu/hr / 1020 Btu/scf
Maximum Fuel Usage - GNS	0.088	Mgal/hr	= 60.5 MMBtu/hr*10^6 Btu/MMBtu / 10469 Btu/lb / 6.6 lb/gal*10% - Assuming Maximum of 10% Capacity
Hours Restriction	8,760	hrs/yr	Continuous annual operations

B-1.1.1 Constants and Conversion Factors

Constants	Value	Units	Basis
Density of GNS	6.6	lb/gal	lb/gal (assumed based on ethanol)
Heating Value of NG	1,020	Btu/scf	Standard HHV from AP-42 Section 1.4; used in Title V renewal application
Heating Value of GNS	10,469	Btu/lb	Btu/lb (2019 Alcor sampling results, per ASTM D240)
	69.1	MMBtu/Mgal	Calculated
	0.0145	Mgal/MMBtu	Calculated

B-2. Boiler 11 (EU ID 15) Natural Gas Emission Factors

B-2.1 Emission Factor Basis

B-2.1.1 Criteria Pollutants Emission Factors

Pollutant	CAS #	Emission Factor (lb/MMBtu)	Emission Factor (lb/MMscf)	Emission Factor Basis
PM	na	0.0075	7.6	AP-42 Section 1.4 Table 1.4-2 (7/98)
PM-CON = PM10-CON = PM25-CON	na	0.0056	5.7	AP-42 Section 1.4 Table 1.4-2 (7/98)
PM-FIL	na	0.0019	1.9	AP-42 Section 1.4 Table 1.4-2 (7/98)
PM10	na	0.0075	7.6	PM = PM10
PM10-FIL	na	0.0019	1.9	PM = PM10
PM2.5	na	0.0075	7.6	PM = PM2.5
PM2.5-FIL	na	0.0019	1.9	PM = PM2.5
SO2	07446-09-5	0.0006	0.60	AP-42 Section 1.4 Table 1.4-2 (7/98)
NOx	10102-44-0	0.0490	50.0	AP-42 Section 1.4 Table 1.4-1 (7/98), factor for small (<100 MMBtu/hr) boiler with LNB but no FGR
CO	00630-08-0	0.0824	84.0	AP-42 Section 1.4 Table 1.4-1 (7/98), factor for small boiler
VOC	na	0.0054	5.50	AP-42 Section 1.4 Table 1.4-2 (7/98)

B-2.1.2 HAP Emission Factors

Pollutant	CAS #	Emission Factor (lb/MMBtu)	Emission Factor (lb/MMscf)	Emission Factor Basis
Benzene	00071-43-2	2.06E-06	2.1E-03	AP-42 Section 1.4 Table 1.4-3 (7/98)
Dichlorobenzene	00095-50-1	1.18E-06	1.2E-03	
Formaldehyde	00050-0-0	7.35E-05	7.5E-02	
Hexane	00110-54-3	1.76E-03	1.8	
Naphthalene	00091-20-3	5.98E-07	6.1E-04	
Toluene	00108-88-3	3.33E-06	3.4E-03	
Sum of POMs	na	8.65E-08	8.8E-05	
Arsenic	07440-38-2	1.96E-07	2.0E-04	
Cadmium	07440-43-9	1.08E-06	1.1E-03	
Chromium	07440-47-3	1.37E-06	1.4E-03	
Cobalt	07440-48-4	8.24E-08	8.4E-05	
Manganese	07439-96-5	3.73E-07	3.8E-04	
Mercury	07439-97-6	2.55E-07	2.6E-04	
Nickel	07440-02-0	2.06E-06	2.1E-03	
Selenium	07782-49-2	2.35E-08	2.4E-05	
Lead	07439-92-1	4.90E-07	5.0E-04	
Total HAP		0.002	1.888	

B-2.1.3 GHG Emission Factors

Global Warming Potentials (GWP) of GHGs per 40 CFR 98 Subpart A, Table A-1.

CO2	1
CH4	25
N2O	298

Pollutant	CAS #	Emission Factor (lb/MMBtu)	Emission Factor (lb/MMscf)	Emission Factor Basis
CO2	00124-38-9	117	119,317	EPA's GHG Reporting Rule (40 CFR 98), Table C-1
CH4	00074-82-8	2.2E-03	2.25	EPA's GHG Reporting Rule (40 CFR 98), Table C-2
N2O	10024-97-2	2.2E-04	0.22	EPA's GHG Reporting Rule (40 CFR 98), Table C-2
CO2e	na	117	119,440	Scaled each pollutant by GWP

B-3. Boiler 11 (EU ID 15) GNS Emission Factors

B-3.1 Emission Factor Basis - Distillate Oil Emission Factors used for GNS

B-3.1.1 Criteria Pollutants Emission Factors

> Pollutant levels are expected to be consistent with or less than traditional fuels such as diesel on a heat input basis. As such, emissions from GNS combustion in Boiler 11 are estimated using AP-42 emission factors for the combustion of distillate oil in boilers.

Pollutant	CAS #	Emission Factor (lb/MMBtu)	Emission Factor (lb/Mgal)	Emission Factor Basis
PM	na	0.0478	3.3	PM-CON + PM-FIL
PM-CON = PM10-CON = PM25-CON	na	0.0188	1.3	AP-42 Section 1.3 Table 1.3-2 (5/10), factor for total condensable particulate matter from No. 2 oil firing
PM-FIL	na	0.0289	2.0	AP-42 Section 1.3 Table 1.3-1 (5/10), factor for small (<100 MMBtu/hr) boiler
PM10	na	0.0478	3.3	PM = PM10
PM10-FIL	na	0.0289	2.0	PM = PM10
PM2.5	na	0.0478	3.3	PM = PM2.5
PM2.5-FIL	na	0.0289	2.0	PM = PM2.5
SO2	07446-09-5	0.0308	2.13	AP-42 Section 1.3 Table 1.3-1 (5/10), using 15 ppmw sulfur as maximum expected from GNS
NOx	10102-44-0	0.2895	20.0	AP-42 Section 1.3 Table 1.3-1 (5/10), factor for small (<100 MMBtu/hr) boiler
CO	00630-08-0	0.0724	5.0	AP-42 Section 1.3 Table 1.3-1 (5/10), factor for small (<100 MMBtu/hr) boiler
VOC	na	0.0029	0.20	AP-42 Section 1.3 Table 1.3-3 (5/10), NMTOC factor for industrial boiler

B-3.1.2 HAP Emission Factors

> Pollutant levels are expected to be consistent with or less than traditional fuels such as diesel on a heat input basis. As such, emissions from GNS combustion in Boiler 11 are estimated using AP-42 emission factors for the combustion of distillate oil in boilers.

Pollutant	CAS #	Emission Factor (lb/MMBtu)	Emission Factor (lb/Mgal)	Emission Factor Basis
Formaldehyde	00050-0-0	8.83E-04	6.1E-02	AP-42 Section 1.3 Table 1.3-8 (5/10), max of range
POM	na	4.78E-05	3.3E-03	AP-42 Section 1.3 Table 1.3-8 (5/10)
Arsenic	07440-38-2	4.00E-06	2.8E-04	AP-42 Section 1.3 Table 1.3-10 (5/10)
Beryllium	07440-41-7	3.00E-06	2.1E-04	
Cadmium	07440-43-9	3.00E-06	2.1E-04	
Chromium	07440-47-3	3.00E-06	2.1E-04	
Manganese	07439-96-5	6.00E-06	4.1E-04	
Mercury	07439-97-6	3.00E-06	2.1E-04	
Nickel	07440-02-0	3.00E-06	2.1E-04	
Selenium	07782-49-2	1.50E-05	1.0E-03	
Lead	07439-92-1	9.00E-06	6.2E-04	
Total HAP		0.001	0.068	

B-3.1.3 GHG Emission Factors

> CO2, CH4 and N2O emissions for GNS combustion are estimated using the ethanol (biomass fuels-liquid) emission factors established by Tables C-1 and C-2 to 40 CFR 98.

Global Warming Potentials (GWP) of GHGs per 40 CFR 98 Subpart A, Table A-1.

CO2	1
CH4	25
N2O	298

Pollutant	CAS #	Emission Factor (lb/MMBtu)	Emission Factor (lb/Mgal)	Emission Factor Basis
CO2	00124-38-9	151	10,425	EPA's GHG Reporting Rule (40 CFR 98), Table C-1
CH4	00074-82-8	2.4E-03	0.17	EPA's GHG Reporting Rule (40 CFR 98), Table C-2
N2O	10024-97-2	2.4E-04	0.02	EPA's GHG Reporting Rule (40 CFR 98), Table C-2
CO2e	na	151	10,435	Scaled each pollutant by GWP

B-4. Boiler 11 (EU ID 15) Maximum PTE

> The following evaluation compares emissions from combusting pure natural gas versus co-firing a mix of 90% natural gas and 10% GNS to supply the maximum heat input rate to Boiler 11. The right-hand columns identify the worst-case annual emissions of each pollutant and the corresponding fuel basis.

	PTE - 100% NG		PTE - 90%/10% Blend		PTE - MAX		
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	Basis
Primary Pollutants							
PM	0.451	1.97	0.695	3.04	0.695	3.04	90%/10% Blend
PM-CON	0.338	1.48	0.418	1.83	0.418	1.83	90%/10% Blend
PM-FIL	0.113	0.494	0.277	1.21	0.277	1.21	90%/10% Blend
PM10	0.451	1.97	0.695	3.04	0.695	3.04	90%/10% Blend
PM10-FIL	0.113	0.494	0.277	1.21	0.277	1.21	90%/10% Blend
PM2.5	0.451	1.97	0.695	3.04	0.695	3.04	90%/10% Blend
PM2.5-FIL	0.113	0.494	0.277	1.21	0.277	1.21	90%/10% Blend
SO2	3.56E-02	0.156	0.219	0.957	0.219	0.957	90%/10% Blend
NOx	2.97	13.0	4.42	19.4	4.42	19.4	90%/10% Blend
CO	4.98	21.8	4.92	21.6	4.98	21.8	100% NG
VOC	0.326	1.43	0.311	1.36	0.326	1.43	100% NG
CO2	7,077	30,998	7,282	31,896	7,282	31,896	90%/10% Blend
CH4	0.133	0.584	0.135	0.590	0.135	0.590	90%/10% Blend
N2O	1.33E-02	5.84E-02	1.35E-02	5.90E-02	1.35E-02	5.90E-02	90%/10% Blend
CO2e	7,084	31,030	7,290	31,929	7,290	31,929	90%/10% Blend
Total HAPs	0.112	0.491	0.107	0.468	0.112	0.491	100% NG
HAPs/metals							
Benzene	1.25E-04	5.46E-04	na	na	1.25E-04	5.46E-04	100% NG
Dichlorobenzene	7.12E-05	3.12E-04	na	na	7.12E-05	3.12E-04	100% NG
Formaldehyde	4.45E-03	1.95E-02	9.34E-03	4.09E-02	9.34E-03	4.09E-02	90%/10% Blend
Hexane	0.107	0.468	na	na	0.107	0.468	100% NG
Naphthalene	3.62E-05	1.58E-04	na	na	3.62E-05	1.58E-04	100% NG
Toluene	2.02E-04	8.83E-04	na	na	2.02E-04	8.83E-04	100% NG
Sum of POMs	5.23E-06	2.29E-05	2.94E-04	1.29E-03	2.94E-04	1.29E-03	90%/10% Blend
Arsenic	1.19E-05	5.20E-05	3.49E-05	1.53E-04	3.49E-05	1.53E-04	90%/10% Blend
Beryllium	na	na	1.82E-05	7.95E-05	1.82E-05	7.95E-05	90%/10% Blend
Cadmium	6.52E-05	2.86E-04	7.69E-05	3.37E-04	7.69E-05	3.37E-04	90%/10% Blend
Chromium	8.30E-05	3.64E-04	9.29E-05	4.07E-04	9.29E-05	4.07E-04	90%/10% Blend
Cobalt	4.98E-06	2.18E-05	na	na	4.98E-06	2.18E-05	100% NG
Manganese	2.25E-05	9.87E-05	5.66E-05	2.48E-04	5.66E-05	2.48E-04	90%/10% Blend
Mercury	1.54E-05	6.75E-05	3.20E-05	1.40E-04	3.20E-05	1.40E-04	90%/10% Blend
Nickel	1.25E-04	5.46E-04	1.30E-04	5.71E-04	1.30E-04	5.71E-04	90%/10% Blend
Selenium	1.42E-06	6.24E-06	9.20E-05	4.03E-04	9.20E-05	4.03E-04	90%/10% Blend
Lead	2.97E-05	1.30E-04	8.11E-05	3.55E-04	8.11E-05	3.55E-04	90%/10% Blend

ATTACHMENT C

NHSM Evaluation

C-1. Non-Hazardous Secondary Material Evaluation for GNS

Table 1. GNS Comparison to Traditional Fuel Oil Contaminant Levels

Contaminants	GNS Sampling Results (ppmw, unless otherwise noted) 1	2	3	4	5	GNS Range ppmw	Traditional Fuel Range ppmw	GNS within Traditional Fuel Range?
Non-metal Elements								
Total Sulfur	--	1.30	2.70	13.80	--	1.30 - 13.80	ND - 57,000	Yes
Total Fluorine	--	*1.00*	*1.00*	*1.00*	--	1.00 - 1.00	ND - 14	Yes
Total Chlorides (chlorine)	--	1.20	1.26	1.25	--	1.20 - 1.26	ND - 1,260	Yes
Nitrogen	--	1.70	1.20	1.50	--	1.20 - 1.70	42 - 8,950	Yes
Metal Elements								
Mercury	*0.02*	*0.02*	*0.02*	*0.02*	--	0.02 - 0.02	ND - 0.2	Yes
Arsenic	0.09	*1.00*	*1.00*	*1.00*	--	0.09 - 1.00	ND - 13	Yes
Beryllium	*0.01*	*0.20*	*0.20*	*0.20*	--	0.01 - 0.20	ND - 19	Yes
Cadmium	*0.01*	*0.20*	*0.20*	*0.20*	--	0.01 - 0.20	ND - 1.4	Yes
Chromium	0.01	*0.50*	*0.50*	*0.50*	--	0.01 - 0.50	ND - 37	Yes
Lead	0.02	*1.00*	*1.00*	*1.00*	--	0.02 - 1.00	ND - 56.8	Yes
Manganese	*0.08*	*0.50*	*0.50*	*0.50*	--	0.08 - 0.50	ND - 3,200	Yes
Nickel	*0.04*	*1.00*	*1.00*	*1.00*	--	0.04 - 1.00	ND - 270	Yes
Selenium	*0.07*	*1.00*	*1.00*	*1.00*	--	0.07 - 1.00	ND - 4.0	Yes
Total Volatile HAP[b,c]								
Acetaldehyde	--	--	--	--	*1.90*	1.90 - 1.90	--	
Methanol	--	--	--	--	*1.90*	1.90 - 1.90	--	
Total Volatile HAP	--	--	--	--	*3.79*	3.79 - 3.79	6,072 - 19,810	Yes

[a] The *Traditional Fuels Range* column presents expected contaminant concentration ranges for traditional fuel oil. These summary statistics were developed by EPA "as a service to assist non-hazardous secondary materials processors and combustors making contaminant comparisons" and can be found at *https://www.epa.gov/rcra/contaminant-concentrations-traditional-fuels-tables-comparison* (November 29, 2011). These ranges are also presented in EPA's 2018 final rule entitled Additions to List of Categorical Non-Waste Fuels: Other Treated Railroad Ties [EPA–HQ–OLEM-2016-0248; FRL-9969-80-OLEM]. The final rule supplements these summary statistics with "SVOC values from 2013 IEc data that will be available in the rule docket."

[b] Acetaldehyde and methanol are both volatile HAPs based on Table 8. Compounds Considered Contaminants -- With Group Information to the 2011 NHSM rule [Federal Register /Vol. 76, No. 247 / Friday, December 23, 2011 / Proposed Rules / pg. 80479]

[c] The method detection limit was converted from mg/L to a ppmw basis using an assumed density for GNS (based on the density of ethanol).

Table 2. GNS Comparison to Federal TSM, Hg, and Cl Limits (Not Directly Applicable to Boiler 11)

> *As an area source of HAP emissions, Buffalo Trace's Frankfort distillery boilers combusting GNS are NOT subject to 40 CFR 63 Subpart DDDDD* (Boiler MACT). Instead, these boilers are subject to 40 CFR 63 Subpart JJJJJJ (Boiler NESHAP); however, the Boiler NESHAP regulation does not establish limits for mercury (Hg), chlorine (Cl), or Total Selected Metals (TSM) for liquid fuel-fired boilers. Therefore, the Boiler MACT regulatory limits are used as surrogates for the limits satisfied by traditional fuels for the purpose of designating the Grain Neutral Spirits (GNS) stream as a Non-Hazardous Secondary Material (NHSM).

> Under the Boiler NESHAP regulation, *liquid fuel* "includes, but is not limited to, light liquid, heavy liquid, any form of liquid fuel derived from petroleum, used oil, liquid biofuels, biodiesel, and vegetable oil."

> The Boiler NESHAP regulation defines *light liquid* as including "distillate oil, biodiesel, or vegetable oil", where:
1. *Biodiesel* is defined as "a mono-alkyl ester derived from biomass and conforming to ASTM D6751-11b".
2. *Distillate oil* is defined as a fuel stream that complies with the specifications for fuel oil numbers 1 and 2 (per ASTM D396 or D975), kerosene, or biodiesel (per ASTM D6751-11b).
3. *Vegetable oil* is defined as "oils extracted from vegetation."

> Buffalo Trace's GNS stream is not a mono-alkyl ester, distillate oil, or vegetable oil. Although it is produced from vegetation, its production involves fermenting the vegetation to produce alcohol, then filtering and distilling the resulting alcohol as opposed to extracting oil directly. Furthermore, this stream is not considered biomass, as that term is limited to bio-based solid fuels under the Boiler MACT regulation.

> As a liquid biofuel that does not meet the definition of light liquid, it would most likely be classified as a *heavy liquid*, which is defined as "residual oil and any other liquid fuel not classified as a light liquid." For conservatism, the following table evaluates whether the distillery would achieve compliance with the Boiler MACT limits for both light and heavy liquid fuel-fired boilers, if this regulation were applicable to Buffalo Trace's Frankfort distillery.

	GNS Sampling Results[a]					Pure GNS	As Combusted	Boiler MACT Limits	
Pollutant	1 ppmw	2 ppmw	3 ppmw	4 ppmw	Average ppmw	100% GNS[b] lb/MMBtu	90% NG/10% GNS Blend[c] lb/MMBtu	Existing Heavy Liquid lb/MMBtu	Existing Light Liquid lb/MMBtu
Mercury	*0.0200*	*< 0.02*	*< 0.02*	*< 0.02*	0.02	1.91E-06	1.91E-07	2.0E-06	2.0E-06
Total Selected Metals (TSM)	0.3241	5.40	5.40	5.40	4.13	3.95E-04	3.95E-05	2.0E-04	6.2E-05
Arsenic	0.0895	*< 1.00*	*< 1.00*	*< 1.00*	0.77				
Beryllium	*0.0114*	*< 0.20*	*< 0.20*	*< 0.20*	0.15				
Cadmium	*0.0095*	*< 0.20*	*< 0.20*	*< 0.20*	0.15				
Chromium	0.011	*< 0.50*	*< 0.50*	*< 0.50*	0.38				
Lead	0.017	*< 1.00*	*< 1.00*	*< 1.00*	0.75				
Manganese	*0.0762*	*< 0.50*	*< 0.50*	*< 0.50*	0.39				
Nickel	*0.0381*	*< 1.00*	*< 1.00*	*< 1.00*	0.76				
Selenium	*0.0714*	*< 1.00*	*< 1.00*	*< 1.00*	*0.77*				
Total Chlorides[e]	--	1.20	1.26	1.25	1.24	1.21E-04	1.21E-05	1.10E-03	1.10E-03

Constants

GNS Net Heat of Combustion	10,469	Btu/lb (Alcor results, per ASTM D240)
GNS Density	6.6	lb/gal (assumed based on ethanol)

[a] For non-detect results, the method detection limit is used. These non-detect results are denoted by *italicized font*.

[b] For comparative purposes, the sampling results are converted from ppm to lb/MMBtu using the heating value of GNS.

[c] Pure GNS is not combusted in Buffalo Trace's facility boilers. Rather, the GNS stream is co-fired with natural gas at a ratio of approximately 5% GNS to 95% gas on a heat input basis. For conservatism, the pollutant concentrations in a 10% GNS to 90% gas mixture are compared to the Boiler MACT limits.

[d] The Boiler MACT limit applies to HCl; therefore, the lb/MMBtu emission factor for total chlorides is multiplied by 1.028, which is the stoichiometric conversion between chlorides and HCl. The Sample 1 non-detect result is omitted from the averaging calculations, as discussed in Table 1.